

Patent claims

1. A processor array
 - having a multiplicity of processor elements,
5 each processor element having:
 - at least one processor,
 - a plurality of power supply interfaces for
transmitting electricity from and to a
10 plurality of processor elements adjacent to
the respective processor element,
 - a plurality of power supply switches, each
power supply interface being assigned a power
supply switch, with which electricity can be
15 supplied or not supplied to the respective
power supply interface as desired,
 - at least one short-circuit testing unit for
sequentially testing whether there is an
electrical short-circuit at a power supply
20 interface to a coupled adjacent processor
element,
 - a control unit, which is set up in such a way
that, for the case in which there is no
short-circuit on the power supply interface,
the respective power supply switch closes, so
25 that electricity can be supplied to the power
supply interface,
 - at least to some extent, only the processor
elements which are arranged locally directly
adjacent to one another being coupled to one
30 another in order to exchange electronic
messages and to transmit electricity.
2. The processor array as claimed in claim 1,
 - in which at least some of the processor
35 elements have a sensor and/or an actuator,
which is/are coupled to the processor,
 - sensor data and/or actuator data being
transmitted in the electronic messages between

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the processor elements arranged adjacent to one another.

3. The processor array as claimed in claim 1 or 2, in
5 which the at least one short-circuit testing unit has a current limiting device.
4. The processor array as claimed in claim 3, in
10 which each power supply switch is assigned a current limiting device.
5. The processor array as claimed in claim 4, in
which at least part of the power supply switch is set up as a current-limited switch.
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6. The processor array as claimed in one of claims 1 to 5, in which the processor elements are arranged in matrix form in rows and columns.
- 20 7. The processor array as claimed in one of claims 1 to 6, having at least one interface processor which provides a message interface of the processor array.
- 25 8. The processor array as claimed in claim 2 and 7, sensor data and/or actuator data being transmitted in the electronic messages from and to the interface processor.
- 30 9. A fabric structure having a processor array as claimed in one of claims 1 to 8,
• in which the processors and/or sensors and/or actuators are arranged in the fabric structure,
• having electrically conductive filaments which
35 couple the processors to one another,
• having conductive data transmission filaments which couple the processors to one another, and
• having electrically nonconductive filaments.

10. The fabric structure as claimed in claim 9, in which the electrically conductive filaments are set up in such a way that they can be used for the power supply to the plurality of processors and/or sensors and/or actuators.
11. The fabric structure as claimed in claim 9 or 10, in which the conductive data transmission filaments are electrically conductive.
12. The fabric structure as claimed in claim 9 or 10, in which the conductive data transmission filaments are optically conductive.
13. The fabric structure as claimed in one of claims 9 to 12, in which the actuator is set up as at least one of the following elements:
- an image-generating element or
 - a sound wave generating element or
 - a vibration-generating element.
14. A surface-covering structure, in which a surface covering is fixed on a fabric structure as claimed in one of claims 6 to 10.
15. The surface-covering structure as claimed in claim 14, in which the surface covering is adhesively bonded and/or laminated and/or vulcanized on the fabric structure.
16. The surface-covering structure as claimed in claim 14 or 15, in which the surface-covering structure is formed as:
- a wall-covering structure or
 - a floor-covering structure or
 - a ceiling-covering structure.

17. The surface-covering structure as claimed in one of claims 14 to 16, in which a textile layer interspersed uniformly with electrically conductive wires is applied at least over subregions of the fabric structure.
18. A processor element, having
- at least one processor,
 - a plurality of power supply interfaces for transmitting electricity from and to a plurality of processor elements adjacent to the respective processor element,
 - a plurality of power supply switches, each power supply interface being assigned a power supply switch, with which electricity can be supplied or not supplied to the respective power supply interface as desired,
 - at least one short-circuit testing unit for sequentially testing whether there is an electrical short-circuit at a power supply interface to a coupled adjacent processor element,
 - a control unit, which is set up in such a way that, for the case in which there is no short-circuit on the power supply interface, the respective power supply switch closes, so that electricity can be supplied to the power supply interface.
19. A method for transmitting electricity between a multiplicity of processor elements arranged locally adjacent to one another, each processor element having:
- at least one processor,
 - a plurality of power supply interfaces for transmitting electricity from and to a plurality of processor elements adjacent to the respective processor element,

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- a plurality of power supply switches, each power supply interface being assigned a power supply switch, with which electricity can be supplied or not supplied to the respective power supply interface as desired,
- at least to some extent, only the processor elements arranged locally directly adjacent to one another being coupled to one another to exchange electronic messages and to transmit electricity, sensor data and/or actuator data being transmitted in electronic messages between the processor elements,
 - in the method, a check being made at a power supply interface as to whether there is an electric short-circuit to coupled adjacent processor element, and
 - for the case in which there is no short-circuit at the power supply interface, the respective power supply switch being closed, so that electricity can be supplied to the power supply interface.